

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

09/623819

INTERNATIONAL APPLICATION NO.
PCT/DE00/00102INTERNATIONAL FILING DATE
JANUARY 13, 2000PRIORITY DATE CLAIMED
JANUARY 21, 1999TITLE OF INVENTION
PNEUMATIC SUSPENSION SYSTEMAPPLICANT(S) FOR DO/EO/US
ANTONIO BRANCO, ULRICH SONNAK, MICHAEL WEBER

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371 (f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau)
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has **NOT** expired.
 - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

PCT/ISA/210 - Int'l. Search Report (English)

2 sheets of formal drawings

Cover sheet WO 00/43692

APPLICATION NO. (if known, see 37 CFR 1.5)

09/623819

INTERNATIONAL APPLICATION NO
PCT/DE00/00102ATTORNEY'S DOCKET NO
BRANCO ET AL-1
(PCT)☒ The following fees are submitted:

Basic National Fee (37 CFR 1.492(a)(1)-(5)):

Search Report has been prepared by the EPO or JPO.....\$840.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)
.....\$670.00Neither international preliminary examination fee paid (37 CFR 1.82) nor
international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....\$970.00International preliminary examination fee paid to USPTO (37 CFR 1.482)
and all claims satisfied provisions of PCT Article 33(2)-(4).....\$96

\$ 840.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

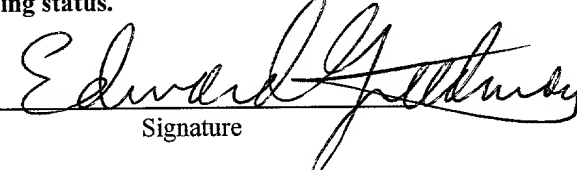
Surcharge of \$130.00 for furnishing the oath or declaration later than ____ 20 ____ 30
months from the earliest claimed priority date (37 CFR 1.492(e)).

Claims	Number Filed	Number Extra	Rate		
Total Claims	13 - 20 =	- 0 -	X \$18.00	\$	
Independent Claims	1 - 3 =	- 0 -	X \$78.00	\$	
Multiple dependent claim(s) (if applicable)			+ \$260.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28).				\$	
SUBTOTAL =				\$ 840.00	
Processing fee of \$130.00 for furnishing the English translation later than ____ 20 ____ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$ 840.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				See cover sheet attached to assign \$ to be charged to Deposit Acct	
TOTAL FEES ENCLOSED =				\$ 840.00	
				Amount to be: refunded	\$
				charged	\$

- a. ☒ A check in the amount of \$840.00 to cover the above fees is enclosed.
- b. ____ Please charge my Deposit Account No. 03-2468 in the amount of \$_____ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Deposit Account No. 03-2468. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

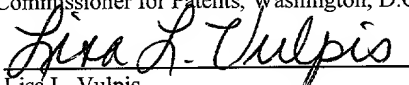
SEND ALL CORRESPONDENCE TO:
COLLARD & ROE, P.C.
1077 Northern Boulevard
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Signature

Edward R. Freedman
Reg. No. 26,048

Express Mail No. **EL 621 967 263 US**
Date of Deposit September 8, 2000

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Lisa L. Vulpis

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: ANTONIO BRANCO ET AL-1 (PCT)

PCT No.: PCT/DE 00/00102 FILED: JANUARY 13, 2000

TITLE: PNEUMATIC SUSPENSION SYSTEM

PRELIMINARY AMENDMENT

BOX PCT

Ass't. Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Preliminary to the initial Office Action, please amend the
above-identified application as follows:

IN THE CLAIMS

Please amend the claims as follows:

Claim 6, line 2, delete "or 5";

Claim 7, lines 1 and 2, delete "any one of claims 1 to 6",
and insert --claim 1--;

Claim 8, lines 1 and 2, delete "any one of claims 1 to 6",
and insert --claim 1--;

Claim 9, lines 1 and 2, delete "any one of claims 1 to 8",
and insert --claim 1--;

Claim 10, lines 1 to 3, delete "any one of claims 1 to 8",
in particular in association with any one of claims 4 to 6, and

insert --claim 1--;

Claim 11, lines 1 and 2, delete "any one of claims 1 to 10",
and insert --claim 1--;

Claim 12, lines 1 and 2, delete "any one of claims 1 to 11",
and insert --claim 1--;

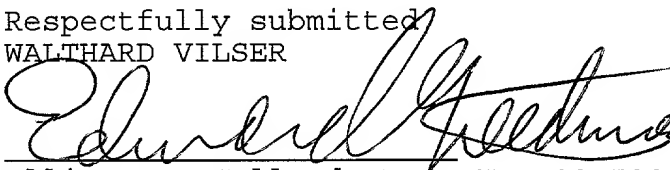
Claim 13, lines 1 and 2, delete "any one of claims 1 to 12",
and insert --claim 1--;

REMARKS

By this Preliminary Amendment, the application has been amended to conform with U.S. practice and the multiple dependency of certain of the dependent claims has been removed so as to avoid the surcharge associated therewith. An early and favorable action on the merits of the application is earnestly solicited.

Respectfully submitted
WALTHARD VILSER

By:


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Lisa L. Vulpis

534 Rec'd PCT/PTO 08 SEP 2000

PNEUMATIC SUSPENSION SYSTEM

DESCRIPTION

The invention relates to a pneumatic suspension system comprising at least the following pneumatic suspension system components:

- A pneumatic suspension bellows made of elastomer material, which has a contouring and an air chamber with a variable volume;
- a pneumatic suspension cover comprising a first fastening zone in which the one end of the pneumatic suspension bellows is secured by means of a clamping ring;
- a pneumatic suspension piston comprising a second fastening zone in which the other end of the pneumatic suspension bellows is secured by means of a clamping ring as well; as well as a roll-off piston on whose outer wall the pneumatic suspension bellows can roll off with formation of a rolling fold;

- an outer guide for the pneumatic suspension bellows;
as well as
- a static zone of the pneumatic suspension bellows
extending from the first fastening zone up to the
outer guide, in most cases in conjunction with an
expansion of the outside diameter of the pneumatic
suspension bellows.

A pneumatic suspension system of said type is described in laid-open patent specification DE 197 19 505 A1 (FIG. 1). In said system, the pneumatic suspension bellows deviates from the usual cylindrical shape. Changes in the diameter occur within the framework of the overall arrangement of the pneumatic suspension bellows, namely in conjunction with the formation of cylindrical, conical and curved zones of the contour (contoured pneumatic suspension bellows).

Furthermore, the pneumatic suspension bellows is provided with an embedded strength carrier in most cases, whereby the strength carrier can be present in the form of a crossed arrangement, for example with the use of two layers of cord fabric that cross each other (DE 41 36 460 A1; FIGS. 2 and 3). Such a pneumatic suspension bellows is referred to also as a crossed-layer bellows. According to another variation, the strength carrier can be present in the form of axially extending thread reinforcements (DE 36 43 073 A1;

FIG. 1). Such a pneumatic suspension bellows is referred to also as an axial bellows.

In pneumatic suspension systems with an outer guide for the pneumatic suspension bellows, whereby particularly axial bellows are employed, undesirable folds and bends may occur under certain circumstances when such a bellows is operating without pressure. Such folds and bends can reduce the useful life.

Now, for the purpose of avoiding the aforementioned problems, the novel pneumatic suspension system, according to the characterizing part of claim 1, is characterized in that the contoured pneumatic suspension bellows comprises a dynamic zone that is subjected within the area of the rolling fold to a change in the diameter of the pneumatic suspension bellows in relation to the outside diameter of the roll-off piston as it is being subjected to load and relieved. When loaded, a reduction in the diameter occurs, and the diameter of the pneumatic suspension bellows is expanded when it is relieved.

Advantageous design variations are specified in the dependent claims 2 to 13. Said variations are now described in the following.

In the unfolded position in the pressureless condition, the dynamical zone of the pneumatic suspension bellows extends at least partially in a conical form. The following two variations are advantageous in this connection:

Variation I

The dynamical zone of the pneumatic suspension bellows extends substantially exclusively conical.

Especially with the present variation, the static zone of the pneumatic suspension bellows changes into the dynamical zone of the pneumatic suspension bellows without a cylindrical intermediate zone.

Variation II

The dynamical zone of the pneumatic suspension bellows has a first conical section that then changes into a cylindrical center section and from there finally again into a second conical section that ends on the second fastening zone. The first conical section has in this connection a greater expanse than the cylindrical center section. The cylindrical center section in turn has a greater expanse than the second conical section.

Especially with this variation, the static zone of the pneumatic suspension bellows changes into a cylindrical intermediate zone, which is static as well, whereby said

intermediate zone is adjoined by the dynamical zone of the pneumatic suspension bellows.

Irrespective of said two variations, the static zone of the pneumatic suspension bellows extends between the first fastening zone and the outer guide, in particular in a substantially exclusively conical form.

Furthermore, irrespective of which one of said two variations is involved, the outer guide encloses in the relieved position substantially the entire dynamical zone of the pneumatic suspension bellows.

The two variations I and II are now described in greater detail as advantageous exemplified embodiments with the help of schematic drawings, in which:

FIG. 1a shows the pneumatic suspension system of the variation I in the unfolded position in the pressureless condition.

FIG. 1b shows the pneumatic suspension system of the variation I in the partly loaded position in the pressureless condition.

FIG. 2a shows the pneumatic suspension system of the variation II in the unfolded position in the pressureless condition; and

FIG. 2b shows the pneumatic suspension system of the variation II in the partly loaded position in the pressureless condition.

The following list of reference symbols is applicable in connection with said figures:

1, 1'	Pneumatic suspension system
2, 2'	Contoured pneumatic suspension bellow
3, 3'	Pneumatic suspension cover
4, 4'	First fastening zone
5, 5'	Clamping ring
6, 6'	Pneumatic suspension piston
7, 7'	Second fastening zone
8, 8'	Clamping ring
9, 9'	Roll-off piston
10, 10'	Air chamber with variable volume
11, 11'	Outer guide
12, 12'	Contact area of the bellows with the outer guide
13, 13'	Roll-off fold of the pneumatic suspension bellows
A	Static zone of the pneumatic suspension bellows
A1	..
A2	..

B	Dynamic zone of the pneumatic suspension bellows
B1	..
B2	..
B3	..
D	Outside diameter of the pneumatic suspension bellows
D1	Outside diameter of the first fastening zone
D2	Outside diameter of the second fastening zone
D3	Outside diameter of the roll-off piston
D4	Diameter of the pneumatic suspension bellows within the area of the rolling fold.

The pneumatic suspension cover 3 of the pneumatic suspension system 1 according to FIG. 1a comprises a first fastening zone 4 with an outside diameter D1, in which the one end of the pneumatic suspension bellows 2 is secured by means of a clamping ring 5. The pneumatic suspension piston 6, which is disposed opposite the pneumatic suspension cover, consists of a second fastening zone 7 with an outside diameter D2, in which the other end of the pneumatic suspension bellows 2 is secured by a clamping ring 8 as well; as well as of a roll-off piston 9 with an outside diameter D3. The pneumatic suspension bellows encloses in this connection an air chamber 10 with a variable volume. In particular the following parameters apply with respect to the outside diameters D1 and D2 of the two fastening zones: D1 > D2.

the contour of the pneumatic suspension bellows. Said rolling fold can roll off on the outer wall of the roll-off piston 9. However, as compared to the condition according to FIG. 1a, no substantial change in the contour of the pneumatic suspension bellows occurs within the static zone A.

Now, the pneumatic suspension bellows 2' of the pneumatic suspension system 1' according to FIG. 2a is characterized by a further advantageous contouring. In the present system, the entire static zone A consists of the two part zones A1 and A2, whereby the conical part zone A1 changes into a cylindrical shape in the contact area 12' of the outer guide 11'. In the present case, the dynamic zone B has a first conical section B1, which is tapering in the direction of the pneumatic suspension piston 6', starting from the outer guide 11', then changing into a cylindrical center section B2, and finally changing again into a second conical section B3, which ends in a tapering form on the second fastening zone 7'. Here, the first conical section B1 has a greater expanse than the cylindrical center section B2. The cylindrical center section B2 in turn has a greater expanse than the second conical section B3.

In the condition of the unfolded position in the pressureless state according to FIG. 2a, the dynamic zone B

of the pneumatic suspension bellows 2' is still free of the rolling fold in the present case as well.

In the pneumatic suspension system 1' according to FIG. 2b, a rolling fold 13' develops within the framework of compression under load within the dynamic zone, attended by a change in the contour of the pneumatic suspension bellows. Said rolling fold is capable of rolling off on the outer wall of the roll-off piston 9'. In the present case, too, no substantial change takes place in the contour of the pneumatic suspension bellow within the static zone A as compared to the condition according to FIG. 2a.

The pneumatic suspension system according to FIG. 1b and, respectively, FIG. 2b is subjected in the course of loading and relieving to a change of the diameter D4 within the zone of the rolling fold 13 and 13', respectively, namely with respect to the outside diameter D3 of the roll-off piston 9 and 9', respectively. When loaded, a reduction of the diameter D4 occurs, and when relieved, the diameter D4 of the pneumatic suspension bellows is increased.

CLAIMS

1. A pneumatic suspension system (1, 1') consisting of at least the following pneumatic suspension system components:

- A pneumatic suspension bellows (2, 2') made of elastomer material, said bellow having an contouring and enclosing an air chamber (10, 10') with a variable volume, whereby the pneumatic suspension bellows is provided with an embedded strength carrier in most cases, in particular in the form of axially extending thread reinforcements;
- a pneumatic suspension cover (3, 3') comprising a first fastening zone (4, 4') with an outside diameter (4, 4'), on which the one end of the pneumatic suspension bellows (2, 2') is secured by means of a clamping ring (5, 5') or the like;
- a pneumatic suspension piston (6, 6') comprising a second fastening zone (7, 7') with an outside diameter (D2) on which the other end of the pneumatic suspension bellows (2, 2') is secured by means of a clamping ring (8, 8') as well; as well as a roll-off piston (9, 9') with an outside diameter (D3), on whose outer wall the pneumatic suspension

bellows can roll off in conjunction with the formation of a rolling fold (13, 13');

- an outer guide (11, 11') for the pneumatic suspension bellows (2, 2'); as well as
- a static zone (A) of the pneumatic suspension bellows (2,2') extending starting from the first fastening zone (4, 4') up to the outer guide (11, 11'), in conjunction with an increase in the outside diameter (D) of the pneumatic suspension bellows in most cases;

characterized in that

- the contoured pneumatic suspension bellows (2, 2') comprises a dynamic zone (B) subjected within the area of the rolling fold (13, 13') to a change in the diameter (D4) of the pneumatic suspension bellows as it is being loaded and relieved, such change occurring with respect to the outside diameter (D3) of the roll-off piston (9, 9').

2. The pneumatic suspension system according to claim 1, characterized in that in the unfolded position in the pressureless state, the dynamic zone (B) of the pneumatic

suspension bellows (2, 2') extends at least partially in a conical form.

3. The pneumatic suspension system according to claim 2, characterized in that the dynamic zone (B) of the pneumatic suspension bellows extends substantially exclusively in a conical form.

4. The pneumatic suspension system according to claim 2, characterized in that the dynamic zone (B) of the pneumatic suspension bellows (2') has a first conical section (B1), said section then changing in a cylindrical center section (B2), and from there then changing again in a second conical section (B3), the latter ending in the second fastening zone (7').

5. The pneumatic suspension system according to claim 4, characterized in that the first conical section (B1) has a greater expanse than the cylindrical center section (B2).

6. The pneumatic suspension system according to claim 4 or 5, characterized in that the cylindrical center section (B2) has a greater expanse than the second conical section (B3).

7. The pneumatic suspension system according to any one of claims 1 to 6, characterized in that within the

dynamic zone (B), the following parameters are applicable to the outside diameter (D) of the pneumatic suspension bellows (2, 2') in the condition of the unfolded position in the pressureless state, namely based on the outside diameter (D3) of the roll-off piston (9, 9'):

D (maximum) = 1.2 times D3

D (minimum) = D3.

8. The pneumatic suspension system according to any one of claims 1 to 6, characterized in that within the dynamic range (B), the following parameters are applicable to the outside diameter (D) of the pneumatic suspension bellows (2, 2') in the condition of the unfolded position in the pressureless state, namely based on the outside diameter (D3) of the roll-off piston (9, 9')

D (maximum) = 1.15 times D3

D (minimum) = 1.05 times D3.

9. The pneumatic suspension system according to any one of claims 1 to 8, in particular in association with claim 3, characterized in that the static zone (A) of the pneumatic suspension bellows (2) changes in the dynamic zone (B) of the pneumatic suspension bellows without a cylindrical intermediate section.

10. The pneumatic suspension system according to any one of claims 1 to 8, in particular in association with any

one of claims 4 to 6, characterized in that the static zone (A) of the pneumatic suspension bellows (2') changes into a cylindrical intermediate section (A2), the latter being static as well, whereby said intermediate section (A2) is adjoined by the dynamic section (B) of the pneumatic suspension bellows.

11. The pneumatic suspension system according to any one of claims 1 to 10, characterized in that the static zone (A, A1) of the pneumatic suspension bellows (2, 2') extends substantially exclusively in a conical form between the first fastening zone (4, 4') and the outer guide (11, 11').

12. The pneumatic suspension system according to any one of claims 1 to 11, characterized in that in the relieved state, the outer guide (11, 11') substantially enclosed the entire dynamic zone (B) of the pneumatic suspension bellows (2, 2').

13. The pneumatic suspension system according to any one of claims 1 to 12, characterized in that the following parameters are applicable to the outside diameter (D1) of the first fastening zone (4, 4') and to the outside diameter (D2) of the second fastening zone (7, 7'):

$$D1 \geq D2.$$

ABSTRACT

The invention relates to a pneumatic suspension system (1) consisting of at least the following pneumatic suspension components:

- A pneumatic suspension bellows (2) made of elastomer material, said bellows having a contouring and enclosing an air chamber (10) with a variable volume;
- a pneumatic suspension cover (3) comprising a first fastening zone (4) with an outside diameter (D1), on which the one end of the pneumatic suspension bellows (2) is secured by means of a clamping ring (5);
- a pneumatic suspension piston (6) comprising a second fastening zone (7) with an outside diameter (D2) on which the other end of the pneumatic suspension bellows (2) is secured by means of a clamping ring (8) as well; as well as a roll-off piston with an outside diameter (D3), on whose outer wall the pneumatic suspension bellows can roll off in conjunction with the formation of a rolling fold;
- an outer guide (11) for the pneumatic suspension bellows (2); as well as
- a static zone (A) of the pneumatic suspension bellows (2), said static zone extending starting from the first fastening zone (4) up to the outer guide (11).

- The pneumatic suspension system as defined by the invention is characterized in that
- the contoured pneumatic suspension bellows (1) comprises a dynamic zone (B) which, with respect to the pneumatic suspension system, is subjected to a change in the diameter of the pneumatic suspension bellows within the zone of the rolling fold as the bellows is being loaded and relieved, namely with respect to the outside diameter (D3) of the roll-off piston (9).

1/2

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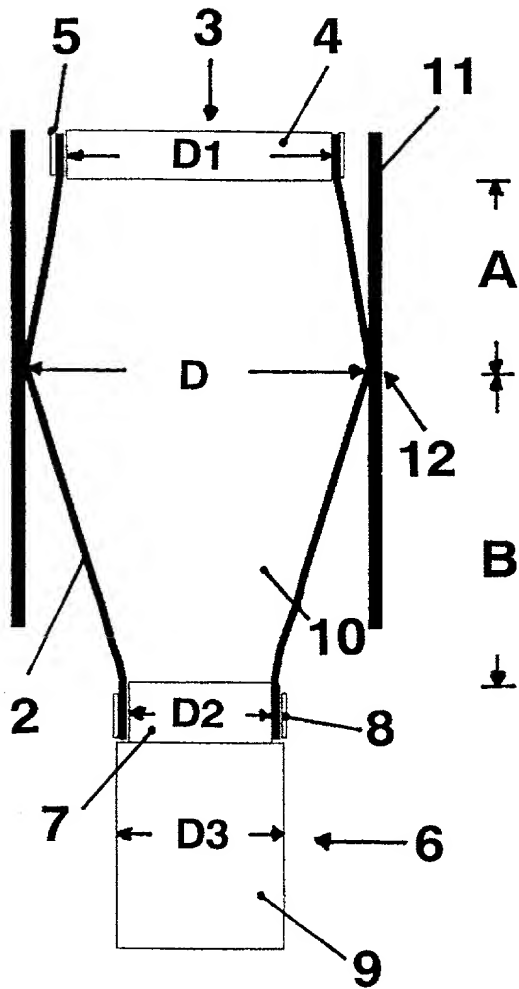


Fig. 1a

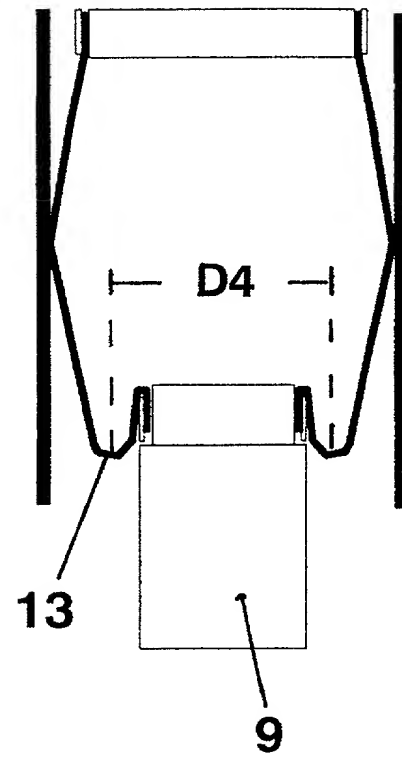


Fig. 1b

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

PNEUMATIC SUSPENSION SYSTEM

the specification of which (check only one item below):

- ☐ is attached hereto.
- ☐ was filed as United States application
Serial No. _____
on _____,
and was amended
on _____ (if applicable).
- ☒ was filed as PCT international application
Number PCT/DE00/00102
on JANUARY 13, 2000,
and was amended under PCT Article 19
on _____ (if applicable).

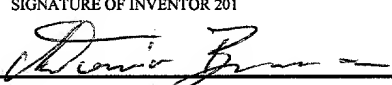
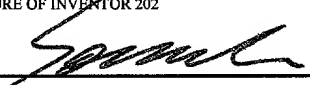
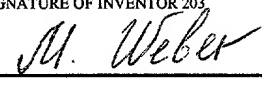
I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
GERMANY	199 02 360.3	JANUARY 21, 1999	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (Includes Reference to PCT International Applications)			ATTORNEY'S DOCKET NUMBER BRANCO ET AL-1 PCT	
I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:				
PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120.				
U.S. APPLICATIONS			STATUS (Check One)	
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)		
POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration numbers): <div style="display: flex; justify-content: space-between;"> <div> <u>ALLISON C. COLLARD, Registration No. 22,532;</u> <u>EDWARD R. FREEDMAN, Registration No. 26,048;</u> <u>ELIZABETH COLLARD RICHTER, Registration No. 35,103</u> </div> <div> <u>WILLIAM C. COLLARD, Registration No. 38,411</u> <u>FREDERICK J. DORCHAK, Registration No. 29,298</u> <u>KURT KELMAN, Registration No. 18,628</u> </div> </div>				
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2 0 2	FULL NAME OF INVENTOR	FAMILY NAME <u>BRANCO</u>	FIRST GIVEN NAME <u>ANTONIO</u>	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY <u>HAMBURG</u>	STATE OR FOREIGN COUNTRY <u>GERMANY</u>	COUNTRY OF CITIZENSHIP <u>PORTUGAL</u>
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>GAISERSTRASSE 6A</u>	CITY <u>D-21073 HAMBURG</u>	STATE & ZIP CODE/COUNTRY <u>GERMANY</u>
2 0 2	FULL NAME OF INVENTOR	FAMILY NAME <u>SONNAK</u>	FIRST GIVEN NAME <u>ULRICH</u>	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY <u>HAMBURG</u>	STATE OR FOREIGN COUNTRY <u>GERMANY</u>	COUNTRY OF CITIZENSHIP <u>GERMANY</u>
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>HINZEWEG 7</u>	CITY <u>D-21075 HAMBURG</u>	STATE & ZIP CODE/COUNTRY <u>GERMANY</u>
2 0 3	FULL NAME OF INVENTOR	FAMILY NAME <u>WEBER</u>	FIRST GIVEN NAME <u>MICHAEL</u>	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY <u>BUCHHOLZ</u>	STATE OR FOREIGN COUNTRY <u>GERMANY</u>	COUNTRY OF CITIZENSHIP <u>GERMANY</u>
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>BREMER STRASSE 20</u>	CITY <u>D-21244 BUCHHOLZ</u>	STATE & ZIP CODE/COUNTRY <u>GERMANY</u>
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.				
SIGNATURE OF INVENTOR 201		SIGNATURE OF INVENTOR 202		SIGNATURE OF INVENTOR 203
				
DATE <u>19.07.2000</u>		DATE <u>20.08.2000</u>		DATE <u>19.07.2000</u>